CLAIMS

What is claimed is:

1. An apparatus for facilitating ultrasound scans of a breast of a supine patient, comprising a reservoir having a conformable, acoustically conductive membrane including a first area contacting an upward-facing surface of the breast, the reservoir maintaining an acoustically conductive fluid at a surface level sufficient to submerge said first area such that a transducer surface, when submerged into the fluid, comes into substantial acoustic communication with the upward-facing surface of the breast.

2. The apparatus of claim 1, the transducer being manually submerged and manipulated to acquire the ultrasound scans, said apparatus further comprising a position sensing system obtaining transducer location information corresponding to the ultrasound scans, whereby a volumetric representation of the breast can be computed using said ultrasound scans and said corresponding location information.

3. The apparatus of claim 2, wherein said ultrasound scans are planar scans, and wherein said transducer comprises a linear array transducer.

4. The apparatus of claim 3, further comprising a vibrational resonance audio source acoustically integrated into said reservoir.

5. The apparatus of claim 1, further comprising a mechanical manipulator moving the transducer beneath said surface level to acquire the ultrasound scans, whereby a volumetric representation of the breast can be computed using said ultrasound scans.

6. The apparatus of claim 5, wherein said ultrasound scans are planar scans, and wherein said transducer comprises a first linear array transducer.

7. The apparatus of claim 6, wherein said transducer further comprises a second linear array transducer having a common scanning plane with said first linear array transducer, said first and second linear array transducers having scanning directions within said common scanning plane that differ by a first nonzero angle, whereby

outputs of said first and second linear array transducers can be compounded to reduce shadowing effects in the ultrasound scans.

8. The apparatus of claim 7, wherein said first nonzero angle is at least 30 degrees.

9. The apparatus of claim 7, wherein said mechanical manipulator translates said first and second linear array transducers in a direction substantially parallel to a coronal plane of the supine patient.

10. The apparatus of claim 7, wherein said mechanical manipulator rotates said first and second linear array transducers around an axis substantially perpendicular to a coronal plane of the supine patient.

11. The apparatus of claim 6, wherein said transducer further comprises a second linear array transducer having a scanning plane non-parallel to a scanning plane of said first linear array transducer, whereby first and second intermediate volumetric representations separately derived from outputs of said first and second array transducers, respectively, can be compounded to reduce shadowing effects in the ultrasound scans.

12. The apparatus of claim 11, wherein said mechanical manipulator translates said first and second linear array transducers in a direction substantially parallel to a coronal plane of the supine patient.

13. An apparatus for ultrasonically scanning a breast of a supine patient, comprising:

a probe assembly comprising first and second linear array transducers affixed thereto, said first and second linear array transducers having scanning directions within a common scanning plane that differ by a first nonzero angle;

a reservoir having a conformable, acoustically conductive membrane including a first area contacting an upward-facing surface of the breast, the reservoir maintaining an acoustically conductive fluid at a surface level sufficient to submerge said first area;

a mechanical manipulator positioning said probe assembly such that a scanning surface of each of said first and second linear array transducers is submerged in said

fluid to achieve acoustic contact with the upward-facing surface of the breast, said mechanical manipulator moving said probe assembly during a scanning session such that said common scanning plane passes through substantially all of an interior volume of the breast.

14. The apparatus of claim 13, wherein said first nonzero angle is at least 30 degrees.

15. The apparatus of claim 13, wherein said mechanical manipulator translates said first and second linear array transducers in a direction substantially parallel to a coronal plane of the supine patient.

16. The apparatus of claim 13, wherein said mechanical manipulator rotates said first and second linear array transducers around an axis substantially perpendicular to a coronal plane of the supine patient.

17. An apparatus for ultrasonically scanning a breast of a supine patient, comprising:

a probe assembly comprising first and second linear array transducers having non-parallel scanning planes differing by a first nonzero angle;

a reservoir having a conformable, acoustically conductive membrane including a first area contacting an upward-facing surface of the breast, the reservoir maintaining an acoustically conductive fluid at a surface level sufficient to submerge said first area;

a mechanical manipulator positioning said probe assembly such that a scanning surface of each of said first and second linear array transducers is submerged in said fluid to achieve acoustic contact with the upward-facing surface of the breast, said mechanical manipulator actuating said probe assembly during a scanning session such that the scanning plane of each of said first and second linear array transducers passes through substantially all of an interior volume of the breast.

18. The apparatus of claim 17, wherein said first nonzero angle is at least 30 degrees.

19. The apparatus of claim 17, wherein said mechanical manipulator translates said first and second linear array transducers in a direction substantially parallel to a coronal plane of the supine patient.

20. The apparatus of claim 17, wherein said mechanical manipulator varies an elevation angle of the scanning plane for each of said first and second linear transducer arrays relative to a coronal plane of the supine patient.